

Data integration: Problem set #2

Problem 1

You are supposed to represent in XML the information about students, courses, and student enrollments (in courses). Typical properties (name,...) should be represented. Your schema should have a nested structure.

Design a schema for your XML database using (a) DTDs, (b) XML Schema, and (c) non-deterministic tree automata.

Suppose you'd like to use the same element `<name>` to denote both student name and course name. Which of the three schema formalisms listed above would allow you to do that? Explain how.

Problem 2

Are the two XPath expressions `//a` and `/descendant::a` equivalent? If not, show an XPath expression in which replacing one by the other yields an inequivalent result.

Problem 3

Write the following queries in XQuery using the schema from Problem 1:

1. *Find all the courses with the enrollment above 100, ordered by increasing enrollment.*
2. Restructure the database, so that the information is represented in a way similar to a relational database (flat tables).